notably for the young cod, ling, and Pleuronectids, and, indeed, Haacke has already pointed this out from a study of the Australian fish *Helotes scotus*,[1] the adult of which is marked by eight longitudinal bands, while young specimens present in addition a row of clear transverse bands which subsequently disappear.

(*To be continued.*)

NOTES.

ON account of the severe illness of his child, Prof. Mendeleeff was obliged to leave London early on Tuesday morning, very greatly to the regret of those who assembled in the evening to hear him deliver the Faraday Lecture, which was read by the Secretary. It was announced that the dinner, at which the Fellows of the Chemical Society proposed to entertain Prof. Mendeleeff on Wednesday evening, would not take place, but that the President, Dr. Russell, and Miss Russell would receive at the Grosvenor Gallery on Friday evening, as before arranged.

THE Ladies' *Conversazione* of the Royal Society will be held on Wednesday, June 19.

THE *conversazione* of the Society of Arts will take place at the South Kensington Museum on Friday, June 28.

IT has been decided that a statue shall be erected in honour of the late John Ericsson in Stockholm. His biography, papers, and letters will be edited by one of his most intimate friends, Colonel Church, of the American *Army and Navy Journal.*

DR. GEORGE OWEN REES, F.R.S., died at Mayfield, Watford, Herts, on May 27. Dr. Rees took his degree of M.D. at Glasgow in 1837, and became a Fellow of the Royal Society in 1843.

IT is requested that all persons having in their possession letters from the late President of Columbia College, Frederick A. P. Barnard, will be kind enough to send them to Prof. Nicholas Murray Butler, Columbia College, New York, U.S.A., at their early convenience. The letters will be returned after copies have been made.

SIR LYON PLAYFAIR, who recently resigned the secretaryship of the Royal Commission of the Exhibition of 1851, has been succeeded by Major-General Ellis, Equerry to the Prince of Wales.

Allen's Indian Mail reports that Dr. Burgess, Director of the Archæological Survey of India, will come home immediately, and that he is retiring from his appointment.

THE foundation-stone of the Framjee Dinshaw Petit Laboratory of Scientific Research, in Bombay, was laid on April 8 by Lord Reay. Mr. Petit, the son of the donor, explained that it had appeared to his father desirable, in the interests of medical education, that a laboratory for scientific research in biological and physical sciences should be established. He had long cherished the wish to have the properties of Indian drugs investigated, and made known to medical students. The laboratory, which will be connected with the Grant Medical College, was described by Lord Reay as the only missing link in the educational programme he had sketched out for Bombay.

THE Allan Line steamer *Caspian*, which arrived from Halifax at Queenstown on Tuesday evening, reported having passed in the North Atlantic no fewer than thirteen large icebergs. The ship steamed quite close to one of them on Thursday last.

WE are glad to be able to report the publication of synoptic weather maps twice a day by the Central Physical Observatory at St. Petersburg, beginning with May 12. The stations for which information is given extend from the west of Ireland to the Ural Mountains and the western shores of the Caspian, and from the north of Norway to the Trans-Caucasus, showing the weather-conditions at a glance, over nearly the whole of Europe. The atmospheric pressure is represented by isobars, and other elements by figures and symbols; the charts being printed on the back of the tabular reports, which have been issued since 1872. A general summary of the weather is given in Russian and French.

WE print elsewhere a letter by Prof. Herdman on unusually large hailstones which fell at Liverpool on June 2. A correspondent writes to us from Rock Ferry about the same hailstones. "Five minutes after they fell," says our correspondent, "when the rain had subsided, I examined some. They were then all quite transparent outside, and had a spherical opaque centre surrounded by concentric rings alternately transparent and opaque. Some were flat: the largest I picked up measured one inch by three-quarters of an inch, and a quarter of an inch thick; its edge was very irregular. Others were more spherical in general form, but some still had rhombohedral faces very well defined. It was half an hour before all were melted."

ON April 30, about 7 a.m., an earthquake was felt at Sokendal, in Dalerne, on the west coast of Norway. It was accompanied by a rumbling noise like distant thunder, going from east to west. The weather was clear and the wind north-west.

SERIOUS efforts are being made to establish a great National Home-reading Circle Union, and we are glad to learn that they are likely to be successful. One object of the Union will be to publish courses of reading for three classes of readers—young persons, artisans, and general readers. The various courses will be approved by experts, and so planned as to interest and liberalize the mind as well as to convey useful information. Local circles will be formed under suitable leaders, and encouraged to meet frequently for the discussion of the subjects they have been studying. In many different ways the Union will try to aid the readers, and there can be little doubt that the scheme will be of real service to a very large number of persons who have often felt the need of guidance in their attempts at intellectual work. In all the courses science will receive the place which properly belongs to it, but adequate attention will also be given to literature and history.

DOES the cuckoo ever hatch its own eggs? Herr Adolf Müller answers this question in the affirmative, and has given in the *Gartenlaube* a full account of a case which he himself claims to have observed. A translation of this account has appeared in the *Ibis*, and is reproduced in the new number of the *Zoologist.* The latter periodical prints also a translation of an article in which Herr Adolf Walter disputes the statements of Dr. Müller, who, he thinks, must have made a mistake. The same subject is dealt with in the June number of the *Selborne Magazine* by Mr. C. Roberts, who quotes from "Zoonomia" an interesting passage, in which Dr. Erasmus Darwin expresses his belief that the cuckoo sometimes makes a nest and hatches its own young. In this passage Dr. Darwin gives an extract from a letter of the Rev. Mr. Wilmot, of Morley, near Derby, describing an instance brought to Mr. Wilmot's notice in July 1792 by one of his labourers, and afterwards closely watched by Mr. Wilmot himself. Mr. Wilmot was confident that the bird was a cuckoo, but this is a point about which most ornithologists would no doubt like to have a little more evidence.

EVERYONE who takes the slightest interest in natural history will be sorry to learn that the kangaroo is in danger of being extinguished. Its skin is so valuable that large numbers of young kangaroos are killed, and high authorities are of opinion that, unless the process is stopped, Australians will soon have seen the last specimen of this interesting animal. Mr. R. G. Salomon, one of the largest tanners in the United States, whither kangaroo-skin is chiefly sent, urges that a fine should be imposed for the killing of any kangaroo whose skin weighs less than ten-twelfths of a pound; and, from a note on the subject in the *Zoologist*, by Mr. A. F. Robin, of Adelaide, we are glad to see that a serious attempt is being made to secure the enforcement of this restriction throughout Australia and Tasmania, and the proclamation of a close season between January 1 and May 1. We must hope that the Australian Legislatures will understand the necessity of taking speedy action in this matter. It would be scandalous if, in deference to the wishes of a few greedy traders, they were to allow Australia to lose the most famous and most interesting of its characteristic fauna.

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[1] One of the Pristipomatidæ.

AT the concluding meeting of the thirty-first session of the Geological Society of Glasgow, which was held last week, Mr. John Young read a paper on "The Occurrence of Spines within Spines on the Shells of the Carboniferous Productidæ." He said that, though long familiar with the spines themselves, it was only recently he had discovered the peculiar structure he was about to describe. He pointed out that the spines of the Productidæ were tubular, and referred to the varied opinions expressed by those palæontologists who had previously taken up the group for investigation respecting the functions of these spines. Mr. Young said he had now discovered that within the tubes of the spines, of at least four species, there existed a barrier of small spines of microscopic size placed in the tubes just above the junction of the spines with the shell itself. These small spines were planted deeply within the walls of the large spines, and radiated to the centre of the tubes, varying from twenty to forty or more in number. He was inclined to believe that the detection of these minute spines favours the view held by De Verneuil, that the spines themselves conveyed water to the interior of the shell. In illustration of his paper, Mr. Young exhibited under the Society's microscope several beautifully prepared slides showing the presence and arrangement of these remarkable "spines within spines."

A SERIES of new aromatic compounds of bismuth have been prepared by Drs. Michaelis and Marquardt. The first member of the series, bismuth triphenyl, $Bi(C_6H_5)_3$, is a solid, crystallizing in two distinct forms of the monoclinic system, thus forming an example of dimorphism in the same system. In order to obtain it a quantity of the sodium-bismuth alloy is first prepared by melting 500 grammes of bismuth in a Hessian crucible and gradually adding 50 grammes of sodium in small pieces. The resulting hard alloy is then powdered in a warmed metallic mortar, and heated for two days to 160° C. in an oil bath with an equal weight of brom-benzene, C_6H_5Br, a little acetic ether being from time to time added. The filtered product is afterwards distilled until benzene ceases to pass over; water is then added, and the excess of brom-benzene distilled off in steam, the bismuth triphenyl remaining behind unaltered. The cooled residue in the distilling flask is next extracted with chloroform, the chloroform solution separated and dried over calcium chloride. After removal of the greater part of the chloroform by distillation, the bismuth triphenyl is thrown out of solution, by addition of absolute alcohol, as a brown oil. On standing the oil soon crystallizes, and on recrystallization from a mixture of alcohol and chloroform the bismuth triphenyl is obtained in beautiful long colourless monoclinic prisms of brilliant lustre. The prism angle of these crystals is 109° 40′, and the plane of the optic axes is perpendicular to the plane of symmetry. On the other hand, if pure warm alcohol be employed as the solvent, the crystals are found to be quite different, being tabular in habit, but still belonging to the monoclinic system. The principal prism angle is much less than that of the other form, being 100° 23′, and the plane of the optic axes is parallel to the plane of symmetry. No difference of composition could be detected, but the melting-point of the prismatic variety was found to be 78°, while that of the tabular form was 75°. Both varieties are converted by concentrated hydrochloric acid to benzene and bismuth trichloride—

$$Bi(C_6H_5)_3 + 3HCl = 3C_6H_6 + BiCl_3.$$

In a similar manner two higher homologues of the series, bismuth tritolyl, $Bi(C_6H_4 . CH_3)_3$, and bismuth trixylyl, $Bi[C_6H_3 . (CH_3)_2]_3$, were obtained by heating the bismuth sodium alloy with brom-toluene and brom-xylene respectively. Both form good crystals, but no dimorphism was observed. Perhaps the most important property of the compounds is their affinity for chlorine or bromine, for by direct addition they take up two atoms of either halogen, with production of compounds in which bismuth assumes its full pentad atomicity, thus supplying an additional proof of the similarity of bismuth to antimony, arsenic, phosphorus, and nitrogen. For instance, bismuth triphenyl forms $Bi(C_6H_5)_3Cl_2$ and $Bi(C_6H_5)_3Br_2$, the tolyl and xylyl compounds acting precisely analogously. Not only is this the case, but with nitric acid they form dinitrates of the type $Bi(C_6H_5)_3(NO_3)_2$, neutralizing two equivalents of the acid. It is interesting to note that the preparation of these aromatic compounds of bismuth completes a wider series, for the preparation of which we are mainly indebted to Dr. Michaelis and his assistants, as we are now acquainted with analogous compounds of antimony, arsenic, phosphorus, and nitrogen.

A VIPER and a lizard in spirit were lately sent, for examination, to the British Museum by Mr. R. H. Ramsbotham, Waterside, Todmorden, with the following remarks:—"This adder was caught at Trowbers Warren, Sussex, on April 24, 1889, about noon. It was kept in this bottle without spirit till the following morning, between nine and ten, when the bottle was filled. Immediately after this was done, the lizard (which is still in the bottle, and has not been touched) crawled out of the snake's mouth, and was quite lively for a short time." Commenting in the *Zoologist* on this statement, Mr. G. A. Boulenger points out that it includes three facts well worthy of record: (1) that vipers do occasionally swallow lizards, although their food normally consists of small rodents; (2) that in this instance the snake did not avail itself of its poison-apparatus in seizing its prey; (3) that a lizard retained life for nearly twenty-four hours in the gullet of a viper. The lizard is an adult female, *Lacerta vivipara*.

AMONG the contents of the new number of the Journal of the Anthropological Institute is an interesting paper, by Mr. T. W. Shore, on the distribution and density of the old British population of Hampshire. Miss Buckland has an instructive paper on the monument known as King Orry's grave, in the Isle of Man, compared with tumuli in Gloucestershire. There are also valuable papers on Australian message sticks and messengers, by Mr. A. W. Howitt; on social regulations in Melanesia, by the Rev. R. H. Codrington; and on the Nicobar islanders, by Mr. E. H. Man. The number contains Mr. Galton's Presidential address, which our readers have already had an opportunity of studying.

THE "Medical Register" and the "Dentists' Register," for 1889, have been issued. Both are published under the direction of the General Council of Medical Education and Registration of the United Kingdom.

THE Cambridge University Press has issued a second edition of Mr. M. M. Pattison Muir's "Treatise on the Principles of Chemistry." In the preface, Mr. Muir states that the whole has been thoroughly revised, and that Book II., dealing with chemical kinetics, has been entirely re-written.

MESSRS. LONGMANS AND CO. announce as nearly ready, "Physical and Chemical Studies in Rock-Metamorphism, based on the Thesis written for the D.Sc. Degree in the University of

London, 1888," by the Rev. A. Irving, D.Sc. Lond., Senior Science Master at Wellington College. The same publishers have in preparation seven new volumes of their "Elementary Science Manuals."

THE Smithsonian Institution has published a new edition of Mr. Frank Wigglesworth Clarke's "Tables of Specific Gravity for Solids and Liquids." It is, in effect, a new edition of Part I. of the work called "The Constants of Nature." The tables in this "part" have been revised, rearranged, and as nearly as possible brought up to date. The work is issued in England by Messrs. Macmillan and Co.

THE Abbé Armand David, whose writings on the natural history of China are well known in France, is contributing a series of articles to *Les Missions Catholiques* of Lyons on the fauna of China. In the last issue of that journal he completed the papers on Carnivora.

THE *Publishers' Circular* states that a work entitled "The Ice Age of North America, and its Bearings on the Antiquity of Man," by Prof. G. F. Wright, is announced for early publication by Messrs. Appleton and Co., of New York. It will be amply illustrated from photographs taken by various members of the United States Geological Survey during the past ten years.

A WORK on the Island of Saghalin and its vertebrate fauna, by Dr. Nikolsky, has just been published. The author, a native of Astrakhan, is well acquainted with the fauna of the Altai and West Turkestan, and is known as the writer of an interesting work on the fauna of Lake Balkhash. In his new book he has utilized, besides his own collections, the very rich collections formed by the late M. Polakoff.

MR. W. P. COLLINS has issued a catalogue of works on *Cryptogamia.* He claims to possess a more complete set of books on Diatoms than have ever been advertised in a bookseller's catalogue.

WE have received vol. iii., Part 4 (second series), of the Proceedings of the Linnean Society of New South Wales. It contains the following papers:—Revision of the genus *Heteronyx*, with descriptions of new species, Part 1, by the Rev. T. Blackburn; Diptera of Australia—Part 4, the Simulidæ and Bibionidæ, by Frederick A. A. Skuse (Plate xxxix.); further notes on Australian Coleoptera, with descriptions of new genera and species, by the Rev. T. Blackburn; contributions towards a knowledge of the Coleoptera of Australia—No. 5, on certain species belonging to unrecorded genera, by A. Sidney Olliff; descriptions of hitherto undescribed Australian Lepidoptera (Rhopalocera), by W. H. Miskin; notes on Australian earthworms, Part 5, by J. J. Fletcher; descriptions of Australian Micro-Lepidoptera—Part 15, Œcophoridæ (continued), by E. Meyrick; on simple striated muscular fibres, by W. A. Haswell; jottings from the Biological Laboratory of Sydney University, by W. A. Haswell; Diptera of Australia—Part 5, the Culicidæ, by Frederick A. A. Skuse (Plate xl.); list of the Australian Palæichthyes, with notes on their synonymy and distribution, Part 1, by J. Douglas Ogilby; a list of the birds found in the county of Cumberland, N.S.W., by A. J. North.

THE additions to the Zoological Society's Gardens during the past week include a Grey Ichneumon (*Herpestes griseus*) from India, presented by Mrs. Walter Boden; a Serval (*Felis serval ♂*) from Zambesi, presented by Mr. John Walker; an Ocelet (*Felis pardalis ♂*) from America, a Red Brocket (*Cariacus rufus*), two White-eared Conures (*Conurus leucotis*) from Brazil, an Acouchy (*Dasyprocta acouchy*) from British Guiana, a Brazilian Tree-Porcupine (*Sphingurus prehensilis*), a Blue-fronted Amazon (*Chrysotis æstiva*), a Yellow Hangnest (*Cassicus persicus*) from South America, a Hairy Armadillo (*Dasypus villosus*), a Pileated Jay (*Cyanocorax pileatus*) from La Plata, presented by Mrs. Wolfe; a Diana Monkey (*Cercopithecus diana*, var. *ignita ♀*), a Campbell's Monkey (*Cercopithecus campbelli ♂*) from West Africa, a Musanga Paradoxure (*Paradoxurus musanga*) from the Indian Archipelago, presented by Colonel Wethered; a Nightingale (*Daulias luscinia*), British, presented by Mr. John Young; a Bar-tailed Pheasant (*Phasianus reevesi*) from North China, presented by Mr. Charles J. Lucas; a Yellow-headed Conure (*Conure jendaya*) from South-East Brazil, a Blue-and-Yellow Macaw (*Ara ararauna*), a Blue-fronted Amazon (*Chrysotis æstiva*) from South America, deposited; an American Jabiru (*Mycteria americana*) from Para, an American Tantalus (*Tantalus loculator*) from America, purchased.

OUR ASTRONOMICAL COLUMN.

NEW MINOR PLANET.—A new minor planet, No. 284, was discovered by M. Charlois, of the Nice Observatory, on May 29.

THE SPECTRUM OF χ CYGNI.—At the Wolsingham Observatory, bright lines were seen in the spectrum of χ Cygni on May 19 and 21; D_3 very plain. Confirmed by Mr. Taylor at Ealing.

ASTRONOMICAL PHENOMENA FOR THE WEEK 1889 JUNE 9-15.

(FOR the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)

At Greenwich on June 9

Sun rises, 3h. 46m.; souths, 11h. 59m. 0·6s.; daily increase of southing, 11·6s.; sets, 20h. 12m.: right asc. on meridian, 5h. 11·2m.; decl. 22° 59′ N. Sidereal Time at Sunset, 13h. 26m.

Moon (Full on June 13, 14h.) rises, 14h. 48m.; souths, 20h. 35m.; sets, 2h. 9m.*: right asc. on meridian, 13h. 48·4m.; decl. 5° 45′ S.

Planet.	Rises.		Souths.		Sets.		Right asc. and declination on meridian.			
	h.	m.	h.	m.	h.	m.	h.	m.	°	′
Mercury..	4	52 ...	12	59 ...	21	6 ...	6	11·6 ...	22	6 N.
Venus.....	2	9 ...	9	14 ...	16	19 ...	2	26·1 ...	11	53 N.
Mars......	3	50 ...	12	9 ...	20	28 ...	5	21·3 ...	23	47 N.
Jupiter....	21	18*...	1	13 ...	5	8 ...	18	23·3 ...	23	9 S.
Saturn....	8	28 ...	16	3 ...	23	38 ...	9	15·5 ...	17	7 N.
Uranus ...	14	23 ...	19	54 ...	1	25*...	13	7·3 ...	6	28 S.
Neptune..	3	4 ...	10	52 ..	18	40 ...	4	3·7 ...	19	8 N.

* Indicates that the rising is that of the preceding evening and the setting that of the following morning.

June.		h.		
14	...	9	...	Jupiter in conjunction with and 0° 29′ south of the Moon.
14	...	20	...	Mercury at greatest distance from the Sun.

Variable Stars.

Star.	R.A.		Decl.				h.	m.	
	h.	m.	°	′					
T Cassiopeiæ ...	0	17·2 ...	55	11 N. ...	June	9,			*M*
U Cephei	0	52·5 ...	81	17 N. ...	,,	9,	23	28	*m*
					,,	14,	23	8	*m*
R Geminorum ...	7	0·7 ...	22	53 N. ...	,,	14,			*M*
S Hydræ	8	47·8 ...	3	29 N. ...	,,	12,			*M*
U Hydræ	10	32·1 ...	12	48 S. ...	,,	9,			*m*
W Virginis	13	20·3 ...	2	48 S. ...	,,	10,	3	0	*m*
S Libræ	15	15·0 ...	19	59 S. ...	,,	14,			*m*
U Ophiuchi... ...	17	10·9 ...	1	20 N. ...	,,	12,	0	7	*m*
X Sagittarii... ...	17	40·6 ..	27	47 S. ...	,,	14,	1	0	*m*
Y Sagittarii... ...	18	14·9 ...	18	55 S. ...	,,	14,	2	0	*M*
R Sagittarii... ...	19	10·2 ...	19	30 S. ...	,,	13,			*M*
β Lyræ...	18	46·0 ...	33	14 N. ...	,,	13,	0	0	*M*
η Aquilæ	19	46·8 ...	0	43 N. ...	,,	13,	22	0	*M*
T Vulpeculæ ...	20	46·8 ...	27	50 N. ...	,,	12,	1	0	*m*
δ Cephei	22	25·1 ...	57	51 N. ...	,,	10,	2	0	*m*

M signifies maximum; *m* minimum.